

SECTION 3.1

DRY CLEANING

(Updated September 1991)

EMISSION INVENTORY SOURCE CATEGORY

Cleaning & Surface Coatings / Dry Cleaning

SOURCE INVENTORY CODES AND DESCRIPTION

210-200-8150-0000 (46797) Dry Cleaning - Petroleum Solvent

210-200-3300-0000 (46805) Dry Cleaning - Perchloroethylene

210-200-8102-0000 (82305) Dry Cleaning - Other Synthetic Solvents

METHODS AND SOURCES

This category includes emissions of total organic gases (TOG) resulting from the use by the dry cleaning industry of **Petroleum Solvent** (CES 46797), **Perchloroethylene** (CES 46805), and **Other Synthetic Solvents**, primarily trichlorotrifluoroethane (CES 82305). The dry cleaning industry includes coin-operated facilities, commercial facilities, and industrial cleaners. Excluded from these area source emissions data are dry cleaning emissions accounted for in the point source inventory.

To estimate the usage of perchloroethylene in California, the quantity of perchloroethylene both shipped into and produced in the state by domestic producers and the quantity of imported perchloroethylene used in California are determined. There are five companies in the U.S. which produce perchloroethylene. The only producer in California is the Dow Chemical facility located in Pittsburg. The Halogenated Solvents Industry Alliance (HSIA) provided a 1985 estimate of the quantity shipped into California by domestic producers.¹ This amount, which is assumed to include production of Dow Chemical's Pittsburg facility, is updated to 1989 by applying the ratio of 1989 U.S. production of perchloroethylene to 1985 U.S. production. U.S. production data, compiled by the International Trade Commission, is presented in the periodical, Chemical and Engineering News.²

The amount of imported perchloroethylene used in California is estimated by multiplying the amount imported into the U.S. by the ratio of domestically-produced perchloroethylene usage in California to the amount produced and used in the U.S. (total U.S. production minus exports). Data on U.S. imports and exports of perchloroethylene were obtained from Bureau of

the Census publications.^{3,4} Since the most current data is for 1988, the data were updated to 1989 using information cited in a recent issue of the Chemical Marketing Reporter.⁵ This periodical describes the changes in U.S. imports and exports from 1988 to 1989. The calculations for determining the quantity of imported perchloroethylene used in California are presented in the sample calculations section. This value is added to the quantity shipped into and produced in the state by domestic producers to obtain total perchloroethylene usage in California by the dry cleaning industry.

According to the Rand Corporation,⁶ 88 percent of the perchloroethylene used is emitted; approximately 12 percent of the total represents waste generation in the form of still residues, standard cartridge filters, adsorptive cartridge filters, etc. Statewide emissions of perchloroethylene are estimated by multiplying 0.88 by total perchloroethylene usage.

To estimate the usage of petroleum solvent and trichlorotrifluoroethane in California, data derived from a 1983 report by the South Coast Air Quality Management District⁷ was used. These data show that 95 percent of the total solvents used in dry cleaning facilities in the District is perchloroethylene, 3.32 percent is Stoddard solvent, and 1.68 percent is trichlorotrifluoroethane. The total usage derived for trichlorotrifluoroethane is then reduced by 10 percent to account for waste generation.⁶

Statewide emissions are summarized in Table I. These emissions data are apportioned to the counties on the basis of population and are summarized in Table II, III and IV.

ASSUMPTIONS

1. The quantity of perchloroethylene shipped into California in 1985 by domestic producers, provided by HSIA, may be updated to 1989 on the basis of national production of perchloroethylene.
2. The ratio of domestically-produced perchloroethylene used in California to the amount used in the U.S. may be applied to the amount of perchloroethylene imported into the U.S. to determine the amount of imported perchloroethylene shipped to California.
3. The proportions of perchloroethylene, petroleum solvent, and trichlorotrifluoroethane to total dry cleaning solvents derived from SCAQMD's report are applicable for all counties.
4. The Rand Corporation's estimates of the portions of perchloroethylene and trichlorotrifluoroethane used in the U.S. which are actually emitted are representative of conditions in California.
5. The emissions data may be apportioned to the counties using population.

COMMENTS AND RECOMMENDATIONS

More accurate data on the amounts of petroleum solvent and trichlorotrifluoroethane used in California for dry cleaning are needed. Also, more current information on the fraction which is actually emitted is needed for perchloroethylene and trichlorotrifluoroethane.

CHANGES IN METHODOLOGY

There are no changes in the methodology.

DIFFERENCES BETWEEN 1989 AND 1987 EMISSION ESTIMATES

The 1989 emission estimates are lower than the 1987 estimates. Perchloroethylene and trichlorotrifluoroethane emissions have decreased by approximately 3 percent and 7 percent, respectively, while petroleum solvent emissions have decreased by 8 percent. These changes are primarily due to more efficient dry cleaning machines and greater efforts to recover and recycle perchloroethylene creating a lower demand for these solvents.

TEMPORAL ACTIVITY

The annual activity is uniform. The weekly activity is minimal on weekends. Most of the daily activity occurs during normal operating hours, from 7:00 a.m. to 6:00 p.m.

SAMPLE CALCULATIONS

A. Calculate statewide perchloroethylene emissions for 1989.

1. Determine the quantity of perchloroethylene shipped into or produced in California in 1989 by domestic producers.

In 1985, 14,930 tons of perchloroethylene were shipped into the state.¹ This amount is updated to 1989 using the ratio of 1989 U.S. production to 1985 U.S. production.²

$$\begin{aligned}1989 \text{ U.S. prod.} &= 475,000,000 \text{ lbs} = 237,500 \text{ tons} \\1985 \text{ U.S. prod.} &= 678,000,000 \text{ lbs} = 339,000 \text{ tons}\end{aligned}$$

Therefore, the amount shipped to CA in 1989 is estimated:

$$\begin{aligned}1989 \text{ CA domestic} &= 14,930 \text{ tons} * (237,500/339,000) \\&= 10,460 \text{ tons}\end{aligned}$$

2. Determine the quantity of imported perchloroethylene used in California.

The amount of imported perchloroethylene used in California for dry cleaning is estimated by multiplying the amount imported into the U.S. by the ratio of California domestic use to the amount produced and used in the U.S. (total U.S. production minus exports).

First, the amount imported into the U.S. in 1988 is 59,714 tons.³ According to the Chemical Marketing Reporter,⁵ 1988 U.S. imports of perchloroethylene fell 4.9 percent from the previous year and that the demand would remain the same for 1989.

$$1989 \text{ U.S. imports} = 59,714 \text{ tons}$$

Second, from A.1. above, domestic use of perchloroethylene in the state in 1989 was estimated to be 10,460 tons while total U.S. production in 1989 was 237,500 tons.

Third, U.S. exports of perchloroethylene in 1989 were 22,741 tons.⁴ Finally, using the above data, the total amount of perchloroethylene imported into the state in 1989 is calculated:

$$\begin{aligned} 1989 \text{ CA imports} &= 59,714 \text{ tons} * [10,460 \text{ tons} / (237,500 \text{ tons} - 22,741 \text{ tons})] \\ &= 2,908 \text{ tons} \end{aligned}$$

3. Determine the total quantity of perchloroethylene (domestic use plus imported use) for 1989.

$$\begin{aligned} \text{Total perc use} &= 10,460 \text{ tons} + 2,908 \text{ tons} \\ &= 13,368 \text{ tons} \end{aligned}$$

4. Of the total quantity of perchloroethylene used, approximately 88 percent is actually emitted; waste generation in the form of still residues, standard cartridge filters, adsorptive cartridge filters, etc. represent the remaining 12 percent.⁶ Thus:

$$\begin{aligned} \text{Total perc emitted} &= 13,368 \text{ tons} * 0.88 \\ &= 11,764 \text{ tons/year} \end{aligned}$$

The density of perchloroethylene, 13.55 pounds per gallon,⁸ is the TOG emission factor for **Perchloroethylene** (CES 46805). Using this value and the quantity of perchloroethylene emitted, an annual process rate of 1,736,384 gallons is derived.

$$\begin{aligned} \text{Perc process rate} &= 11,764 \text{ tons} * 2,000 \text{ lbs/ton} / 13.55 \text{ lbs/gal} \\ &= 1,736,384 \text{ gallons} \end{aligned}$$

B. Calculate statewide petroleum solvent and trichlorotrifluoroethane emissions for 1989.

1. Based on data derived from a SCAQMD report,⁷ perchloroethylene represents 95 percent of the total solvents used in dry cleaning, Stoddard solvent represents 3.32 percent, and trichlorotrifluoroethane (Freon 113) represents 1.68 percent. Using the total of 13,368 tons of perchloroethylene consumed in 1989, it is estimated that 444 tons of Stoddard solvent and 203 tons of Freon 113 were consumed in the dry cleaning industry.
2. The density of Stoddard solvent, 6.5 pounds per gallon,⁸ is the TOG emission factor for **Petroleum Solvent** (CES 46797). Using this value and the quantity of 444 tons consumed, an annual process rate of 136,559 gallons is derived. It is assumed that there are no controls and that the entire quantity is emitted.

$$\begin{aligned}\text{Stoddard process rate} &= 444 \text{ tons} * 2,000 \text{ lbs/tons} / 6.5 \text{ lbs/gal} \\ &= 136,559 \text{ gallons}\end{aligned}$$

3. Of the total quantity of Freon 113 used, approximately 90 percent is actually emitted; the remaining 10 percent represents the amount of waste generated.⁶ Thus:

$$\begin{aligned}\text{Total Freon 113 emitted} &= 225 \text{ tons} * 0.9 \\ &= 203 \text{ tons/year}\end{aligned}$$

The density of Freon 113, 13.05 pounds per gallon,⁹ is the TOG emission factor for **Other Synthetic Solvents** (CES 82305). Using this value and the quantity of Freon 113 emitted, an annual process rate of 31,111 gallons is derived.

$$\begin{aligned}\text{Freon process rate} &= 203 \text{ tons} * 2,000 \text{ lbs/ton} / 13.05 \text{ lbs/gal} \\ &= 31,111 \text{ gallons}\end{aligned}$$

- C. The statewide process rate and emission data are apportioned to the counties using population. These data are shown in Table II, III, and IV. Finally, the air pollution control and air quality management districts report dry cleaning emissions data as a point source if a facility emits more than 25 tons per year of any pollutant. These emissions data are subtracted out to avoid double-counting.

REFERENCES

1. Correspondence from D.L. Morgan of Cleary, Gottlieb, Steen and Hamilton (representing the Halogenated Solvents Industry Alliance) to D. Shimp of the California Air Resources Board, (October 28, 1986).
2. Production by the U.S. Chemical Industry, Chemical and Engineering News, 66(25):40, (June 18, 1990).
3. U.S. Department of Commerce, Bureau of the Census, U.S. Imports for Consumption and General Imports, TSUSA commodity by Country of Origin, FT 246/Annual 1988.
4. U.S. Department of Commerce, Bureau of the Census, U.S. Exports - Schedule B commodity by Country, FT 446/Annual 1988.
5. Chlorosolvent Markers Ponder Shaky Outlook, Chemical Marketing Reporter, 233(18):3, (May 2, 1988).
6. K. Wolf and C.W. Myers, Hazardous Waste Management by Small Quantity Generators - Chlorinated Solvents in the Dry Cleaning Industry, Rand Corporation, (June 1987).
7. W.E. Zwiacher, et al., 1983 Emissions of Potentially Toxic/Hazardous Air Contaminants in the South Coast Air Basin, South Coast Air Quality Management District, (September 1983).
8. U.S. Environmental Protection Agency, Air Pollution Engineering Manual. Second Edition. AP-40, page 880, (May 1973).
9. N.I. Sax, Dangerous properties of Industrial Materials, Van Nostrand Reinhold Co., New York, (1984).

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Table I

1989 STATEWIDE EMISSIONS DATA

<u>CES NO.</u>	<u>PROCESS RATE (gal/year)</u>	<u>EMISSION FACTOR (lbs/gal)</u>	<u>TOG EMISSIONS (tons/year)</u>
46797 Petroleum Solvent	136,559	6.50	444
46805 Perchloroethylene	1,736,384	13.55	11,764
82305 Other Synthetic	31,111	13.05	203

Table II
 1989 Area Source Emissions
 Activity: Laundry & Dry Cleaners
 Process: Dry Cleaning
 Entrainment: Non Synthetic-Evap
 DImm: Stoddard
 CES: 46797
 Process Rate Unit: Gallons Processed

AB	County	Process Rate	TOG Emis. (Tons / Year)	CO Emis. (Tons / Year)	NOX Emis. (Tons / Year)	SOX Emis. (Tons / Year)	PM Emis. (Tons / Year)
GBV	ALPINE	6	0.02	0.00	0.00	0.00	0.00
	INYO	87	0.28	0.00	0.00	0.00	0.00
	MONO	47	0.15	0.00	0.00	0.00	0.00
LC	LAKE	253	0.82	0.00	0.00	0.00	0.00
LT	EL DORADO	163	0.53	0.00	0.00	0.00	0.00
MC	PLACER	50	0.16	0.00	0.00	0.00	0.00
	AMADOR	143	0.46	0.00	0.00	0.00	0.00
	CALAVERAS	160	0.52	0.00	0.00	0.00	0.00
	EL DORADO	451	1.47	0.00	0.00	0.00	0.00
	MARIPOSA	72	0.24	0.00	0.00	0.00	0.00
	NEVADA	385	1.25	0.00	0.00	0.00	0.00
	PLACER	99	0.32	0.00	0.00	0.00	0.00
	PLUMAS	97	0.31	0.00	0.00	0.00	0.00
	SIERRA	17	0.05	0.00	0.00	0.00	0.00
NC	TUOLUMNE	229	0.74	0.00	0.00	0.00	0.00
	DEL NORTE	100	0.33	0.00	0.00	0.00	0.00
	HUMBOLDT	565	1.84	0.00	0.00	0.00	0.00
	MENDOCINO	371	1.21	0.00	0.00	0.00	0.00
	SONOMA	263	0.85	0.00	0.00	0.00	0.00
	TRINITY	68	0.22	0.00	0.00	0.00	0.00
NCC	MONTEREY	1683	5.47	0.00	0.00	0.00	0.00
	SAN BENITO	172	0.56	0.00	0.00	0.00	0.00
	SANTA CRUZ	1109	3.60	0.00	0.00	0.00	0.00
NEP	LASSEN	131	0.43	0.00	0.00	0.00	0.00
	MODOC	45	0.15	0.00	0.00	0.00	0.00
	SISKIYOU	212	0.69	0.00	0.00	0.00	0.00
SC	LOS ANGELES	39868	129.57	0.00	0.00	0.00	0.00
	ORANGE	10842	35.23	0.00	0.00	0.00	0.00
	RIVERSIDE	3344	10.87	0.00	0.00	0.00	0.00
	SAN BERNARDINO	4805	15.61	0.00	0.00	0.00	0.00
SCC	SAN LUIS OBISPO	1050	3.41	0.00	0.00	0.00	0.00
	SANTA BARBARA	1669	5.42	0.00	0.00	0.00	0.00
	VENTURA	3065	9.96	0.00	0.00	0.00	0.00
SD	SAN DIEGO	11713	38.07	0.00	0.00	0.00	0.00
SED	IMPERIAL	538	1.75	0.00	0.00	0.00	0.00
	KERN	351	1.14	0.00	0.00	0.00	0.00
	LOS ANGELES	943	3.06	0.00	0.00	0.00	0.00
	RIVERSIDE	1350	4.39	0.00	0.00	0.00	0.00
	SAN BERNARDINO	1224	3.98	0.00	0.00	0.00	0.00
SF	ALAMEDA	5922	19.25	0.00	0.00	0.00	0.00
	CONTRA COSTA	3632	11.80	0.00	0.00	0.00	0.00
	MARIN	1096	3.56	0.00	0.00	0.00	0.00
	NAPA	515	1.67	0.00	0.00	0.00	0.00
	SAN FRANCISCO	3521	11.44	0.00	0.00	0.00	0.00
	SAN MATEO	2969	9.65	0.00	0.00	0.00	0.00
	SANTA CLARA	6938	22.55	0.00	0.00	0.00	0.00
	SOLANO	1106	3.59	0.00	0.00	0.00	0.00
	SONOMA	1504	4.89	0.00	0.00	0.00	0.00
SJV	FRESNO	3024	9.83	0.00	0.00	0.00	0.00
	KERN	2209	7.18	0.00	0.00	0.00	0.00
	KINGS	473	1.54	0.00	0.00	0.00	0.00
	MADERA	410	1.33	0.00	0.00	0.00	0.00
	MERCED	834	2.71	0.00	0.00	0.00	0.00
	SAN JOAQUIN	2214	7.20	0.00	0.00	0.00	0.00
	STANISLAUS	1705	5.54	0.00	0.00	0.00	0.00
	TULARE	1447	4.70	0.00	0.00	0.00	0.00
SV	BUTTE	851	2.77	0.00	0.00	0.00	0.00
	COLUSA	76	0.25	0.00	0.00	0.00	0.00
	GLENN	114	0.37	0.00	0.00	0.00	0.00
	PLACER	627	2.04	0.00	0.00	0.00	0.00
	SACRAMENTO	4797	15.59	0.00	0.00	0.00	0.00
	SHASTA	698	2.27	0.00	0.00	0.00	0.00
	SOLANO	434	1.41	0.00	0.00	0.00	0.00
	SUTTER	302	0.98	0.00	0.00	0.00	0.00
	TEHAMA	228	0.74	0.00	0.00	0.00	0.00
	YOLO	649	2.11	0.00	0.00	0.00	0.00
	YUBA	275	0.89	0.00	0.00	0.00	0.00
TOTAL		136310	442.98	0.00	0.00	0.00	0.00

Fraction of Reactive Organic Gases (FROG): 1.0000
 (Reactive Organic Gases (ROG) Emissions = TOG X FROG)
 Fraction of PM10 (FRPM10): .9600
 (PM10 Emissions = PM X FRPM10)

Table III
1989 Area Source Emissions
Activity: Laundry & Dry Cleaners
Process: Dry Cleaning
Entrainment: Synthetic-Evap
Dimm: Perchloroethylene
CES: 46805
Process Rate Unit: Gallons Processed

AB	County	Process Rate	TOG Emis. (Tons / Year)	CO Emis. (Tons / Year)	NOX Emis. (Tons / Year)	SOX Emis. (Tons / Year)	PM Emis. (Tons / Year)
GBV	ALPINE	73	0.49	0.00	0.00	0.00	0.00
	INYO	1108	7.51	0.00	0.00	0.00	0.00
	MONO	599	4.06	0.00	0.00	0.00	0.00
LC	LAKE	3215	21.78	0.00	0.00	0.00	0.00
LT	EL DORADO	2068	14.01	0.00	0.00	0.00	0.00
	PLACER	641	4.34	0.00	0.00	0.00	0.00
MC	AMADOR	1817	12.31	0.00	0.00	0.00	0.00
	CALAVERAS	2035	13.78	0.00	0.00	0.00	0.00
	EL DORADO	5737	38.87	0.00	0.00	0.00	0.00
	MARIPOSA	920	6.24	0.00	0.00	0.00	0.00
	NEVADA	4899	33.19	0.00	0.00	0.00	0.00
	PLACER	1253	8.49	0.00	0.00	0.00	0.00
	PLUMAS	1229	8.33	0.00	0.00	0.00	0.00
	SIERRA	212	1.44	0.00	0.00	0.00	0.00
	TUOLUMNE	2913	19.73	0.00	0.00	0.00	0.00
	DEL NORTE	1278	8.66	0.00	0.00	0.00	0.00
NC	HUMBOLDT	7188	48.70	0.00	0.00	0.00	0.00
	MENDOCINO	4717	31.96	0.00	0.00	0.00	0.00
	SONOMA	3344	22.65	0.00	0.00	0.00	0.00
	TRINITY	860	5.83	0.00	0.00	0.00	0.00
NCC	MONTEREY	21399	144.98	0.00	0.00	0.00	0.00
	SAN BENITO	2192	14.85	0.00	0.00	0.00	0.00
	SANTA CRUZ	14103	95.55	0.00	0.00	0.00	0.00
NEP	LASSEN	1665	11.28	0.00	0.00	0.00	0.00
	MODOC	575	3.90	0.00	0.00	0.00	0.00
	SISKIYOU	2695	18.26	0.00	0.00	0.00	0.00
SC	LOS ANGELES	507551	3438.66	0.00	0.00	0.00	0.00
	ORANGE	138256	936.68	0.00	0.00	0.00	0.00
	RIVERSIDE	42895	290.61	0.00	0.00	0.00	0.00
	SAN BERNARDINO	61470	416.46	0.00	0.00	0.00	0.00
	SAN LUIS OBISPO	13115	88.86	0.00	0.00	0.00	0.00
SCC	SANTA BARBARA	21217	143.75	0.00	0.00	0.00	0.00
	VENTURA	40207	272.40	0.00	0.00	0.00	0.00
	SAN DIEGO	148928	1008.99	0.00	0.00	0.00	0.00
SD	IMPERIAL	6868	46.54	0.00	0.00	0.00	0.00
	KERN	4459	30.21	0.00	0.00	0.00	0.00
	LOS ANGELES	12148	82.30	0.00	0.00	0.00	0.00
	RIVERSIDE	17278	117.06	0.00	0.00	0.00	0.00
	SAN BERNARDINO	15664	106.13	0.00	0.00	0.00	0.00
	ALAMEDA	75303	510.18	0.00	0.00	0.00	0.00
	CONTRA COSTA	46177	312.85	0.00	0.00	0.00	0.00
	MARIN	13941	94.45	0.00	0.00	0.00	0.00
	NAPA	6546	44.35	0.00	0.00	0.00	0.00
	SAN FRANCISCO	44766	303.29	0.00	0.00	0.00	0.00
SF	SAN MATEO	37752	255.77	0.00	0.00	0.00	0.00
	SANTA CLARA	88213	597.64	0.00	0.00	0.00	0.00
	SOLANO	14061	95.27	0.00	0.00	0.00	0.00
	SONOMA	19129	129.60	0.00	0.00	0.00	0.00
	FRESNO	38451	260.50	0.00	0.00	0.00	0.00
	KERN	28088	190.30	0.00	0.00	0.00	0.00
	KINGS	6013	40.74	0.00	0.00	0.00	0.00
	MADERA	5214	35.32	0.00	0.00	0.00	0.00
	MERCED	10609	71.87	0.00	0.00	0.00	0.00
	SAN JOAQUIN	28151	190.72	0.00	0.00	0.00	0.00
SJV	STANISLAUS	21684	146.91	0.00	0.00	0.00	0.00
	TULARE	18402	124.67	0.00	0.00	0.00	0.00
	BUTTE	10827	73.35	0.00	0.00	0.00	0.00
	COLUSA	963	6.52	0.00	0.00	0.00	0.00
	GLENN	1453	9.85	0.00	0.00	0.00	0.00
	PLACER	7969	53.99	0.00	0.00	0.00	0.00
	SACRAMENTO	60994	413.24	0.00	0.00	0.00	0.00
	SHASTA	8877	60.14	0.00	0.00	0.00	0.00
	SOLANO	5518	37.39	0.00	0.00	0.00	0.00
	SUTTER	3845	26.05	0.00	0.00	0.00	0.00
SV	TEHAMA	2900	19.65	0.00	0.00	0.00	0.00
	YOLO	8247	55.87	0.00	0.00	0.00	0.00
	YUBA	3500	23.71	0.00	0.00	0.00	0.00
	TOTAL	1736384	11764.03	0.00	0.00	0.00	0.00

Fraction of Reactive Organic Gases (FROG): 1.0000
 (Reactive Organic Gases (ROG) Emissions = TOG X FROG)
 Fraction of PM10 (FRPM10): .9600
 (PM10 Emissions = PM X FRPM10)

Table IV
 1989 Area Source Emissions
 Activity: Laundry & Dry Cleaners
 Process: Dry Cleaning
 Entrainment: Synthetic-Evap
 Dimn: Other Synthetic Solvents
 CES: 82305
 Process Rate Unit: Gallons Processed

AB	County	Process Rate	TOG Emis. (Tons / Year)	CO Emis. (Tons / Year)	NOX Emis. (Tons / Year)	SOX Emis. (Tons / Year)	PM Emis. (Tons / Year)
GBV	ALPINE	1	0.01	0.00	0.00	0.00	0.00
	INYO	20	0.13	0.00	0.00	0.00	0.00
	MONO	11	0.07	0.00	0.00	0.00	0.00
LC	LAKE	58	0.38	0.00	0.00	0.00	0.00
LT	EL DORADO	37	0.24	0.00	0.00	0.00	0.00
	PLACER	11	0.07	0.00	0.00	0.00	0.00
MC	AMADOR	33	0.21	0.00	0.00	0.00	0.00
	CALAVERAS	36	0.24	0.00	0.00	0.00	0.00
	EL DORADO	103	0.67	0.00	0.00	0.00	0.00
	MARIPOSA	16	0.11	0.00	0.00	0.00	0.00
	NEVADA	88	0.57	0.00	0.00	0.00	0.00
	PLACER	22	0.15	0.00	0.00	0.00	0.00
	PLUMAS	22	0.14	0.00	0.00	0.00	0.00
	SIERRA	4	0.02	0.00	0.00	0.00	0.00
	TUOLUMNE	52	0.34	0.00	0.00	0.00	0.00
	DEL NORTE	23	0.15	0.00	0.00	0.00	0.00
NC	HUMBOLDT	129	0.84	0.00	0.00	0.00	0.00
	MENDOCINO	85	0.55	0.00	0.00	0.00	0.00
	SONOMA	60	0.39	0.00	0.00	0.00	0.00
	TRINITY	15	0.10	0.00	0.00	0.00	0.00
NCC	MONTEREY	383	2.50	0.00	0.00	0.00	0.00
	SAN BENITO	39	0.26	0.00	0.00	0.00	0.00
	SANTA CRUZ	253	1.65	0.00	0.00	0.00	0.00
NEP	LASSEN	30	0.19	0.00	0.00	0.00	0.00
	MODOC	10	0.07	0.00	0.00	0.00	0.00
	SISKIYOU	48	0.32	0.00	0.00	0.00	0.00
SC	LOS ANGELES	9093	59.34	0.00	0.00	0.00	0.00
	ORANGE	2477	16.16	0.00	0.00	0.00	0.00
	RIVERSIDE	769	5.01	0.00	0.00	0.00	0.00
	SAN BERNARDINO	1101	7.19	0.00	0.00	0.00	0.00
	SAN LUIS OBISPO	235	1.53	0.00	0.00	0.00	0.00
SCC	SANTA BARBARA	380	2.48	0.00	0.00	0.00	0.00
	VENTURA	720	4.70	0.00	0.00	0.00	0.00
	SAN DIEGO	2668	17.41	0.00	0.00	0.00	0.00
SED	IMPERIAL	123	0.80	0.00	0.00	0.00	0.00
	KERN	80	0.52	0.00	0.00	0.00	0.00
	LOS ANGELES	218	1.42	0.00	0.00	0.00	0.00
SF	RIVERSIDE	310	2.02	0.00	0.00	0.00	0.00
	SAN BERNARDINO	281	1.83	0.00	0.00	0.00	0.00
	ALAMEDA	1349	8.80	0.00	0.00	0.00	0.00
	CONTRA COSTA	827	5.40	0.00	0.00	0.00	0.00
	MARIN	250	1.63	0.00	0.00	0.00	0.00
	NAPA	117	0.77	0.00	0.00	0.00	0.00
	SAN FRANCISCO	802	5.23	0.00	0.00	0.00	0.00
	SAN MATEO	676	4.41	0.00	0.00	0.00	0.00
	SANTA CLARA	1581	10.31	0.00	0.00	0.00	0.00
	SOLANO	252	1.64	0.00	0.00	0.00	0.00
SJV	SONOMA	343	2.24	0.00	0.00	0.00	0.00
	FRESNO	689	4.50	0.00	0.00	0.00	0.00
	KERN	503	3.28	0.00	0.00	0.00	0.00
	KINGS	108	0.70	0.00	0.00	0.00	0.00
	MADERA	93	0.61	0.00	0.00	0.00	0.00
	MERCED	190	1.24	0.00	0.00	0.00	0.00
	SAN JOAQUIN	504	3.29	0.00	0.00	0.00	0.00
SV	STANISLAUS	389	2.54	0.00	0.00	0.00	0.00
	TULARE	330	2.15	0.00	0.00	0.00	0.00
	BUTTE	194	1.27	0.00	0.00	0.00	0.00
	COLUSA	17	0.11	0.00	0.00	0.00	0.00
	GLENN	26	0.17	0.00	0.00	0.00	0.00
	PLACER	143	0.93	0.00	0.00	0.00	0.00
	SACRAMENTO	1093	7.13	0.00	0.00	0.00	0.00
	SHASTA	159	1.04	0.00	0.00	0.00	0.00
	SOLANO	99	0.65	0.00	0.00	0.00	0.00
	SUTTER	69	0.45	0.00	0.00	0.00	0.00
Y	TEHAMA	52	0.34	0.00	0.00	0.00	0.00
	YOLO	148	0.96	0.00	0.00	0.00	0.00
	YUBA	63	0.41	0.00	0.00	0.00	0.00
	TOTAL	31110	202.98	0.00	0.00	0.00	0.00

Fraction of Reactive Organic Gases (FROG): .6000
 (Reactive Organic Gases (ROG) Emissions = TOG X FROG)
 Fraction of PM10 (FRPM10): .9600
 (PM10 Emissions = PM X FRPM10)